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Before the Base Realignment and Closure Commission

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I would like to thank the Commission for your dedication in reviewing the recent DOD recommendations on Base Realignment and Closure.

In general, I support BRAC as a necessary part of the process of making our Defense Establishment more effective for the 21st Century.

But I would like to testify here today on an issue about which I believe is essential to the national security of the United States, sustaining our Nation's science and technology (S&T) leadership in defense; leadership which I believe would be damaged by a recommendation in the current BRAC process.

I am here at the request of Arlington County as someone who has experience with bringing S&T to the service of defending our Nation. I am a member of The Cohen Group Team retained by Arlington, but am speaking based on more than 37 years of commissioned service in the US Army.

I retired this January after commanding the Army Materiel Command which was responsible for the Army's Research facilities and interfaces with the Department of Defense and other Services. Previously, I worked in the Pentagon as the Military Deputy in Acquisition, Logistics, and Technology. I taught in the Weapons Systems Department at the United States Military Academy. I led troops in combat in Vietnam as a lieutenant and captain and as a colonel in Desert Storm when I commanded the Second Brigade of the 24th Infantry Division. I have been in and out of Iraq and Afghanistan meeting with our commanders and soldiers to assess the improvements in equipment we need as well as our overall support.

As Division Commander of the 4th Infantry Division (Mechanized), I was responsible for training, developing, and evaluating the technologies which led to the digitized network for ground forces which is in use today.

In each job I directly interfaced with the Defense Director of Research and Engineering, the DARPA Directors, the Navy and Air Force Research Labs, as well as the Soldiers we supported.

I have also worked closely with many university researchers across the United States who funded grants from these organizations in DoD. This is an alliance the military needs, and this research to meet that need, which has been built over more than 60 years of study and practice.

I believe strongly, as a result of this experience, that close ties between the military and research are essential-and very difficult to achieve. It requires continuous work to improve communications between two dedicated groups who live in very different cultures. We have made great strides in achieving the synergy by the hard work of many DDRE's, DARPA Directors, and Research Lab Directors working closely with the combat veterans of all the services.

Tom Friedman's "The World is Flat" lays out the dangers of the loss of scientists, engineers, and mathematicians to the USA. The world produces talent outside US Universities which is quickly outnumbering our University graduates. We should work together to address this issue for economic and military security. We should not undermine it further by destroying the synergy we have achieved.

Technology by itself cannot solve military problems. It is the careful integration of technology with operational methods, training to achieve the desired results, and a clear understanding of the people and environment where the technology will be used which makes a difference.

I would like to strongly support Arlington's recommendation that you challenge the recommendation of the Department of Defense concerning the re-location of the extramural research programs—DARPA, ONR, AOR and AFOSR. These organizations manage and direct basic and applied research and development projects for DOD where risks are higher and payoffs for any military capabilities could be dramatic.

- The DoD recommendation would harm national security by significantly degrading the military value of these organizations and their ability to bring the immense strength of our Nation's civilian S&T intellect and expertise to the service of our warfighters.
- The DoD recommendation would erect significant barriers to regular, open and sustained interaction between the civilian S&T community and the defense extramural research programs.
- The DoD recommendation would break the delicate and essential synergy these defense organizations have developed over many years with their civilian counterparts at the National Science Foundation, located currently within walking distance in Arlington.

Arlington has developed two alternatives for consideration by the Commission and the Department of Defense that have greater military value, cost less, provide greater savings than the DoD recommendation for re-location and also fully comply with DoD anti-terrorism and force protection standards.

The singular importance of technology leadership to the success of the United States armed forces is impossible to overestimate nor is it a new issue.

The debacle of Task Force Smith at the beginning of the Korean War, when our troops were outgunned and their rockets bounced off the attacking tanks, taught us again to never fall behind the technology curve.

We as a nation owe it to our men and women in uniform to ensure that they are not only the best trained and best equipped, but that they also have the technology edge over any adversary---better eyes with sensors, better ears with communications and longer, more accurate reach with weapons.

I am glad to say that our S&T leadership for defense has had strong, unwavering support from successive Secretaries of Defense.

Secretary Rumsfeld in his first Quadrennial Defense Review in 2001 explained the importance of S&T to defense very well.

> "A robust research and development effort is imperative to achieving the Department's transformation objectives. DoD must maintain a strong science and technology (S&T) program that supports evolving military needs and ensures technological superiority over potential adversaries. Meeting transformation objectives also will require new information systems. These must be married with technological advances in other key areas, including stealth platforms, unmanned vehicles, and smart submunitions. To provide the basic research for these capabilities, the QDR calls for a significant increase in funding for S&T programs to a level of three percent of DoD spending per year." QDR 2001, p. 41.

The Army, Navy, Marine Corps and Air Force have all benefited by the phenomenal success of our science and technology community—stealth technology, fire and forget missiles, low cost training simulations, unmanned aircraft, the internet and numerous concepts adding to military value have resulted from our Nation's civilian science and technology community.

We all know that many nations have achieved technical breakthroughs in defense capabilities, including the British with RADAR and the Germans with rockets in World War II. What is so important in the case of the United States is that we have achieved breakthrough after breakthrough for decades.

This is not pure luck, although luck always plays its part.

This is not only skill, although our researchers and industrialists are the best in the world.

This is the result of a sustained, institutionalized effort lead by a unique set of organizations—the Defense Advanced Projects Agency (DARPA), The Office of Naval Research (ONR), the Air Force Office of Scientific Research (AFOSR), and the Army Research Office (ARO), the so-called defense extramural research organizations.

Allow me to quote from the mission statements of each of these organizations to provide a sense of their unique and vital mission for our national security:

> DARPA, "manages and directs selected basic and applied research and development projects for DoD, and pursues research and technology where risk and payoff are both very high and where success may provide dramatic advances for traditional military roles and missions."
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> ONR, "coordinates, executes, and promotes the science and technology programs of the United States Navy and Marine Corps through schools, universities, government laboratories, and nonprofit and for-profit organizations."
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> AFOSR's mission is to, "manage the discovery and initial development of the leading edge of research while identifying potential new concepts and opportunities that will serve the Air Force in the future. To accomplish this role, AFOSR focuses the basic research community (government, academia and industry), including numerous Nobel Laureates, on the vital task of supporting Air Force warfighter requirements. Basic research provides the essential foundation for technology development and systems acquisition."
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> AOR's mission is, "to seed scientific and far reaching technological discoveries that enhance Army capabilities. Basic research proposals from educational institutions, nonprofit organizations, and private industry are competitively selected and funded. ARO's research mission represents the most long-range Army view for changes in its technology."
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> The key points are clear:
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> - Their common mission is advanced defense capabilities
> - Their common strategy is to leverage civilian science and technology breakthroughs
> - Their common task is to work with leading civilian researchers in educational institutions, non-profit organizations, private industry and government laboratories.

And their common requirement is a location with an open environment where, from all over the nation, civilians with innovative ideas and who have not previously dealt with the Department of Defense can easily access their offices.

It is no accident that DARPA, ONR, AFOSR have co-located themselves within easy walking distance of the National Science Foundation in Northern Virginia, with the ARO having a liaison office there as well.

The NSF was founded in 1950 to leverage the nation's S&T resources for the civilian economy just as the military had leveraged those resources for the war effort in World War II. As such, the target clientele of both the NSF and the defense research organizations are the same leading edge civilian S&T researchers.

This co-location with NSF in Northern Virginia has enabled unique synergies of effort and expertise for these defense organizations. Together they have become this Nation's Center of Excellence. The DOD organizations benefit significantly from the strong "gravitational pull" that NSF exerts on the civilian research community in the United States, the same community that the DOD organizations is trying to recruit to support DOD missions.

Re-location of the DoD organizations away from NSF's orbit would decrease the ability of the DOD organizations to recruit researchers, lower the "foot traffic" of the civilian research community for the DoD organizations, and severely damage the synergy of effort that currently exists among these civilian and military organizations with a common purpose and clientele.

Again, Secretary Rumsfeld understands well the fundamental importance of DoD's access to and reliance on non-government civilian S&T research. In-house government research alone cannot maintain the nation's technology edge in defense. His QDR 2001 report is quite clear:

> "During the Cold War, U.S. government programs were a primary impetus for research into new technologies, particularly in areas such as computers and materials. Today and well into the foreseeable future, however, DoD will rely on the private sector to provide much of the leadership in developing new technologies. Thus, the Department has embarked on an effort (a) to turn to private enterprise for new ways to move ideas from the laboratory to the operating forces, (b) to tap the results of innovations developed in the private sector, and (c) to blend government and private research where appropriate. This "quiet revolution" will take advantage of science and technology and continue to provide U.S. forces with technological superiority." QDR 2001, p.41. (Underline added.)

These organizations rely on their ability to recruit S&T talent to the needs of the Defense Department. This is not always easy.

The military culture and community and the civil academic S&T culture and community are not, shall we say, natural overlaps. All—military and civilian alike--love our nation and want to give it their best, but the gaps between the two communities are often large.

And therefore, like recruitment centers for the Army, Navy, Marine Corps and Air Force, these research organizations need to be open, easily accessible and within the civilian community—while at the same time having ready, easy access to Defense leaders at the Pentagon.

The institutional model for the solution to this delicate task was first developed on the eve of America's entry into World War II and has been carefully nurtured and developed for over 60 years.

In 1940, as Europe was engaged in war, it became clear that US defense technology was lagging. In response, President Franklin Roosevelt appointed Dr. Vannevar Bush, then President of the Carnegie Institution in Washington, as Chairman of the Defense Research Committee, a new organization tasked with bringing the insights and expertise of the nation's civilian science and technology community to the service of the War and Navy Departments.

He built a marriage between our nation's Universities, today represented by the National Science Foundation with its headquarters in Arlington, and our military represented by DARPA, ONR, AFOSR, AOR and the Pentagon.

Northern Virginia has been home to the War Department since WWII and now the Department of Defense. Arlington has grown from a rural suburb of DC to a thriving urban community. I have had the opportunity to observe and participate in this growth since the mid 1960's. I have watched the synergy develop around the civilian science community and the Department of Defense which began with the efforts of Vannevar Bush.

These organizations have been developed in an urban environment along a speedy and modern transportation network. This is key to access for multiple organizations worldwide inside and out of government.

The core Military Value of these organizations to the Nation and the Defense Department is clear. It is also clear that these organizations rely on two mission-essential conditions to deliver their Military Value:

- A location with an open environment where, from all over the nation, civilians with innovative ideas and who have not previously dealt with the Department of Defense can easily access their offices, and
- A synergy maintained through daily collaborative efforts with the National Science Foundation and each other.

Re-location of the DoD research organizations from Arlington to a military installation would remove them from their current open environment and significantly increase the barriers to access—both physical and cultural—for the civilian researchers that these organizations are supposed to recruit. As mentioned above, the Services don't put recruiting stations on military installations—they put them in open, easily accessible locations with lots of foot traffic. Similarly, these defense organizations rely on scheduled and unscheduled "drop-in" visits to achieve their missions.

It has been argued in the BRAC recommendations that re-location is necessary to enhance synergy among these organizations. In fact, these organizations have already

developed a high degree of synergy at their current locations, all within easy walking distance of each other. Moving these organizations, even again to the same locations, would result in inevitable disruptions in their joint projects.

Moreover, the DoD recommendation seems to have overlooked the essential synergy of effort that these defense organizations have at their current location with the National Science Foundation, also within an easy walk. NSF, as the leading civilian research counterpart to the DOD organizations, is an invaluable resource and source of regular collaboration opportunities for the DOD research community.

There are vulnerabilities, however, which have been felt in Arlington with the attack on the Pentagon on 9-11. We must work to reduce those vulnerabilities while building upon the Center of Excellence synergy represented by the NSF, DARPA, ONR, AFOSR, ARO and others. The people who work in and support these organizations are unique and a national treasure

The Commonwealth of Virginia and Arlington County have been working to find alternatives that preserve the synergy, which has taken 60+ years to develop and reduce the vulnerabilities. You have heard new ideas, not previously considered by DoD, presented by the community. In just two months, they have found new ways to achieve the goals of BRAC -- increase military value, reduce cost, while meeting DoD's anti-terrorism and force protection standards and not disrupting military functions. They should be given the opportunity to implement these alternatives and find other new ways to continue the transformation of DoD while improving security and military value.

As I mentioned earlier, The Internet, Stealth Technology, fire and forget missiles, low cost training simulations, unmanned aircraft, and numerous concepts adding to military value have grown from this incubator of science and defense. This is a unique place in our nation and we should study it carefully before we destroy its attributes. DoD developed alternatives over 2 years for this BRAC, building on almost 15 years of gathering data and developing options. Virginia has had two months to study 60 years of building a capability around urban leased space and has already found alternatives which warrant further development and implementation.

I have discussed this issue with former Secretaries of Defense, former Undersecretaries, former DDRE's, University Professors, and former senior military leaders. All concur that we should not rush into taking this capability apart. Military value is difficult to tie directly to Science, but it is unquestionable that we won the Cold War and continue to surpass our enemies through men and women of our Armed forces who have had the benefit of the best minds in our country. No one doubts the value of bringing the academic cultures and military cultures together to solve the toughest problems we must confront. We should strengthen this fragile marriage, not add stress to making it work. We should accept the imperative of improving physical security, but not at the expense of tearing apart the synergy that has been achieved, especially when it seems very possible to do both. This is the message I heard from previous leaders and one which I support wholeheartedly.

Military value will only be created by moving ahead faster and not by slowing and damaging that process as a result of re-locating the DOD research organizations as recommended by the DoD BRAC process. The Commission should direct that the criteria be applied to leased space on an equal basis as they have for military installations. Generalities should not destroy 60 years of effort in the service of national security.

Virginia has shown that DoD did not follow its own criteria with respect to leased space. Northern Virginia is unique in the development of leased space for DoD and in the nurturing of the National Science Foundation. Together they create a synergy that is unmatched in the world. We should develop the alternatives proposed and execute whichever one enhances the military value desired with full force protection and least cost.